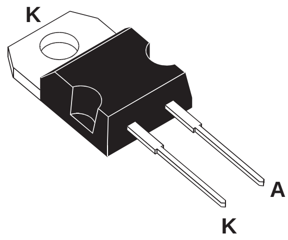
STTH8R03G/D

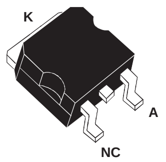
300V HYPERFAST RECTIFIER

MAJOR PRODUCT CHARACTERISTICS

$I_{F(AV)}$	8 A
V_{RRM}	300 V
I_{RM} (typ.)	4A
Tj (max)	175 °C
V_F (max)	1.3 V
trr (max)	30 ns



TO-220AC
STTH8R03D



D^2PAK
STTH8R03G

FEATURES AND BENEFITS

- Designed for high frequency applications.
- Hyperfast recovery competes with GaAs devices.
- Allows size decrease of snubbers and heatsinks.

DESCRIPTION

The TURBOSWITCH "R" is an ultra high performance diode.
This TURBOSWITCH family, which drastically cuts losses in associated MOSFET when run at high dIF/dt, is suited for HF OFF-Line SMPS and DC/DC converters.

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		300	V
$I_{F(RMS)}$	RMS forward current		20	A
$I_{F(AV)}$	Average forward current	Tc = 140°C $\delta = 0.5$	8	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal	80	A
T_{stg}	Storage temperature range		- 65 + 175	°C
Tj	Maximum operating junction temperature		+ 175	°C

February 2001 - Ed: 1H

THERMAL AND POWER DATA

Symbol	Parameter	Value	Unit
$R_{th\ (j-c)}$	Junction to case	2.5	°C/W

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	$V_R = V_{RRM}$	Tj = 25°C			10	µA
			Tj = 125°C		15	100	
V_F **	Forward voltage drop	I_F = 8 A	Tj = 25°C			1.8	V
			Tj = 125°C		1.05	1.3	

Pulse test : * tp = 5 ms, δ < 2 %
** tp = 380 µs, δ < 2%

To evaluate the maximum conduction losses use the following equation :
$P = 0.9 \times I_{F(AV)} + 0.05\ I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Tests conditions		Min.	Typ.	Max.	Unit
trr	I_F = 0.5 A Irr = 0.25 A I_R = 1A	Tj = 25°C		13		ns
	I_F = 1 A dI_F/dt = - 50 A/µs V_R = 30V				30	
I_{RM}	V_R = 200 V I_F = 8A dI_F/dt = - 200A/µs	Tj = 125°C		4	5.5	A
S factor				0.4		

TURN-ON SWITCHING CHARACTERISTICS

Symbol	Tests conditions	Min.	Typ.	Max.	Unit
t_{fr}	Tj = 25°C I_F = 8A dI_F/dt = 100A/µs measured at 1.1x$V_F$max			200	ns
V_{FP}	Tj = 25°C I_F = 8A dI_F/dt = 100A/µs			3.5	V

Fig. 1: Conduction losses versus average current

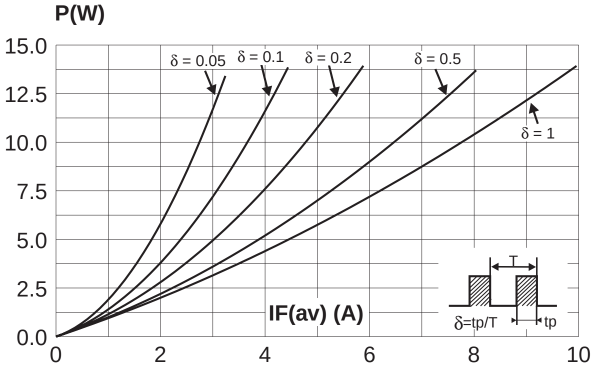


Fig. 2: Forward voltage drop versus forward current.

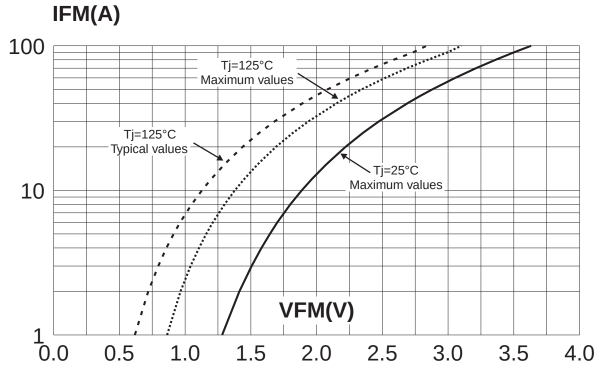


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

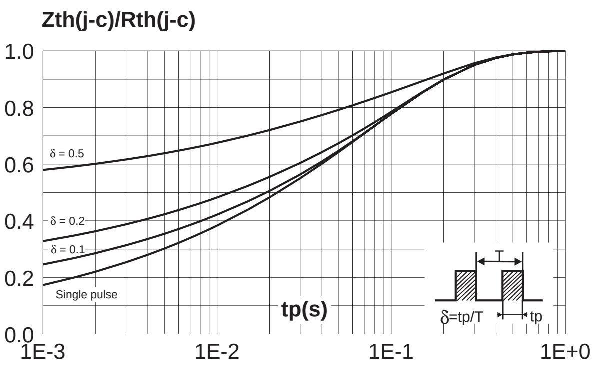


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence).

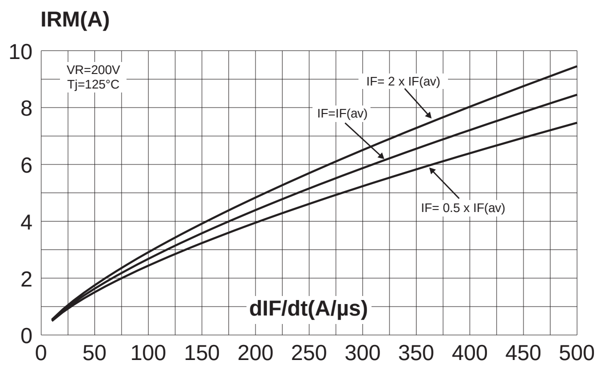


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence).

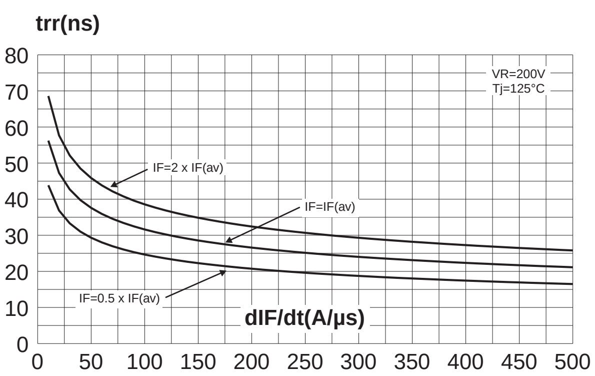


Fig. 6: Reverse recovery charges versus dIF/dt (90% confidence).

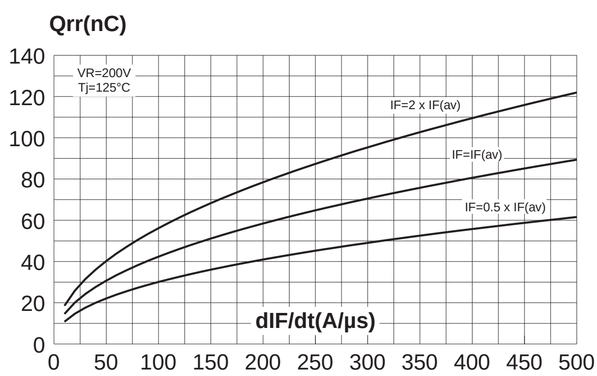


Fig. 7: Softness factor (tb/ta) versus dIF/dt (typical values).

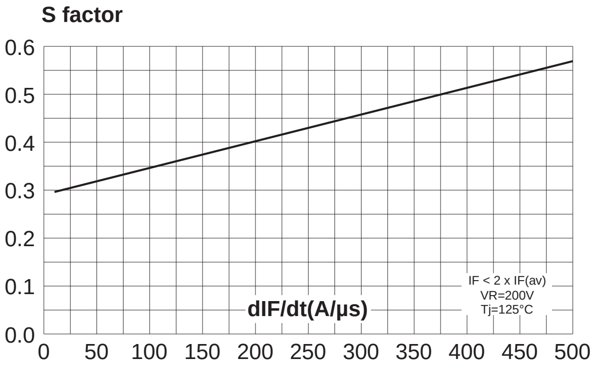


Fig. 8: Relative variation of dynamic parameters versus junction temperature (Reference: Tj=125°C).

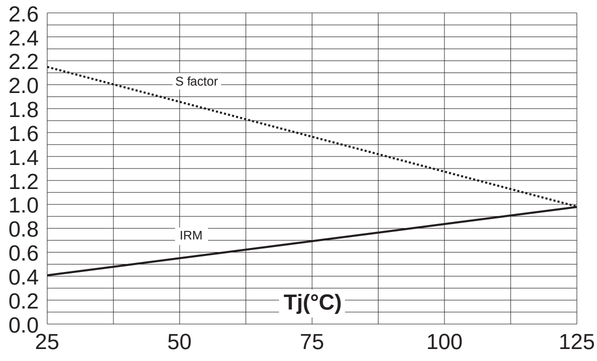


Fig. 9: Transient peak forward voltage versus dIF/dt (90% confidence).

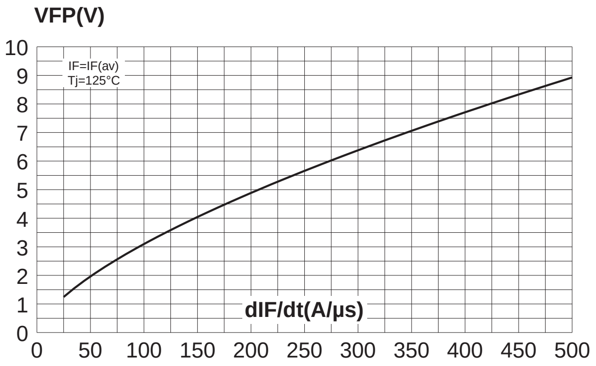


Fig. 10: Forward recovery time versus dIF/dt (90% confidence).

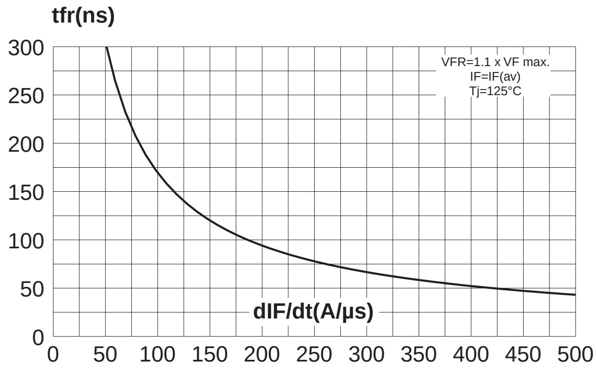
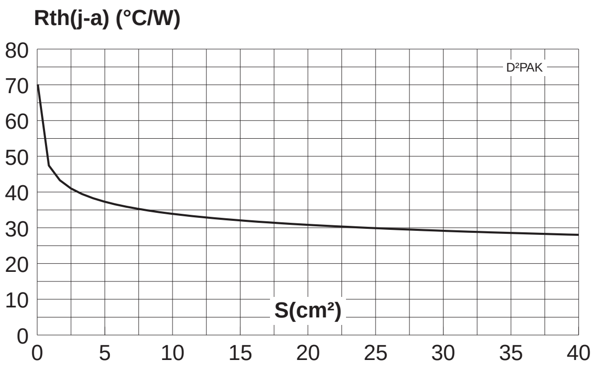
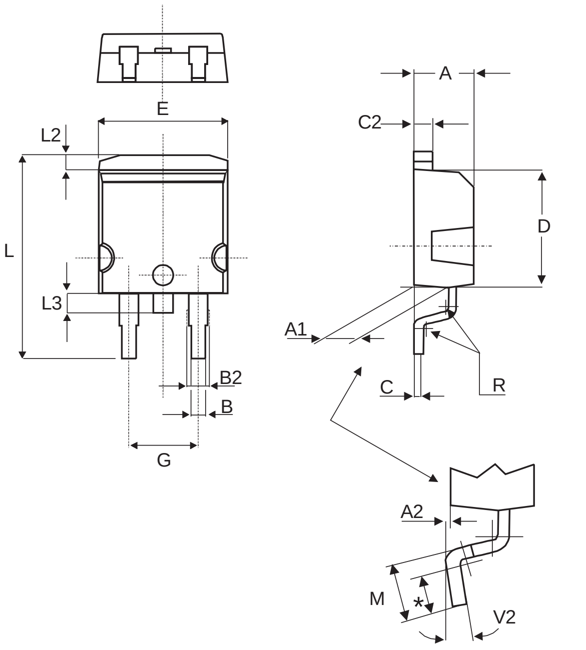


Fig. 11: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm)(D^2PAK)



PACKAGE MECHANICAL DATA

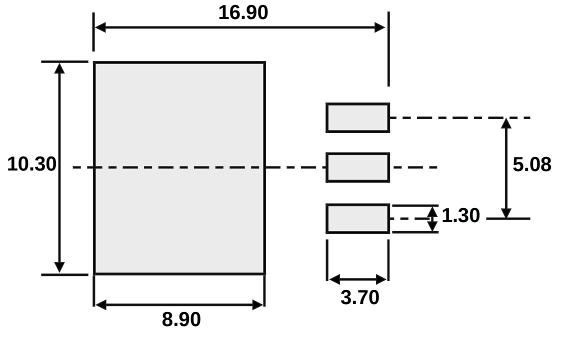
D^2PAK



* FLAT ZONE NO LESS THAN 2mm

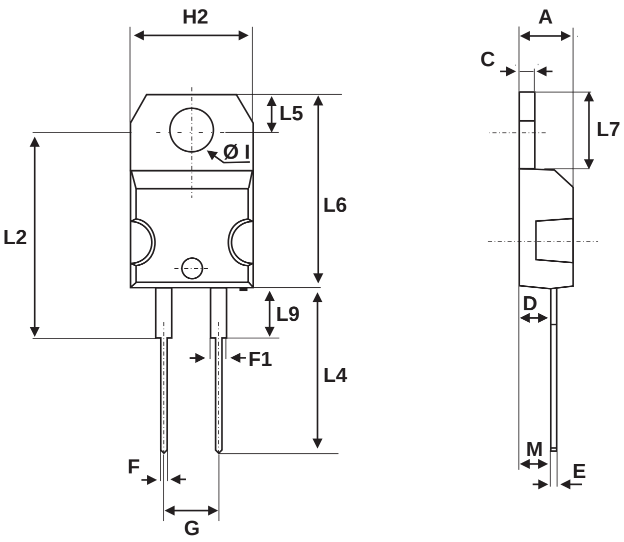
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

FOOTPRINT



PACKAGE MECHANICAL DATA

TO-220AC



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam. I	3.75	3.85	0.147	0.151

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH8R03D	STTH8R03D	TO-220AC	1.86g	50	Tube
STTH8R03G	STTH8R03G	D^2PAK	1.48g	50	Tube
STTH8R03G-TR	STTH8R03G	D^2PAK	1.48g	1000	Tape & Reel

- Cooling method: by conduction (C)
- Recommended torque value (TO-220AC): 0.55 N.m.
- Maximum torque value (TO-220AC): 0.7 N.m.
- Epoxy meets UL 94,V0